

**Abstract**

This invention relates to a method and apparatus for performing microwave assisted chemical reactions, in particular for performing microwave assisted organic synthesis reactions under nearly ideal heating and cooling conditions.

- 5 The method according to the present invention comprises, supplying substances for a chemical reaction into a reaction chamber, which is adapted to withstand high temperature and pressure, applying microwave heating to initiate the chemical reaction and reach a desired temperature, and cooling the reaction mixture to a desired lower temperature by using adiabatic cooling. The invention also relates to
- 10 an apparatus for performing the method and use of the method and apparatus for performing organic synthesis reactions.